MTPX Plus Series

MTP TWISTED PAIR MATRIX SWITCHERS

The Next Generation of Twisted Pair Integration

- Seven models in sizes from 12x8 to 32x32
- Dynamic skew equalization
- Local RS-232 insertion ports
- Video level and peaking compensation
- Video output pre-peaking
- Local video and audio inputs and outputs
- Audio input gain/attenuation adjustment
- Local audio output volume control
- IP Link Ethernet connectivity
- Enhanced QS-FPC™ - QuickSwitch Front Panel Controller
- RS-232/RS-422 switcher control port
- Compatible with Extron MTP Series products, including MTP U Series Universal Twisted Pair Receivers

Extron® Electronics
www.extron.com

Introduction

The Extron **MTPX Plus Series Twisted Pair Matrix Switchers** represent the next generation of twisted pair integration. The advanced technology and feature set offered by the MTPX Plus Series simplifies the design and installation process in complex twisted pair matrix switching applications. The local video and audio inputs and outputs incorporated into the MTPX Plus Series enable direct connection of equipment local to the MTPX Plus or mounted in the same rack, eliminating the need for additional MTP transmitters and receivers. The MTPX Plus Series also provides dynamic skew equalization on all inputs and outputs. This industry-first innovation ensures that skew caused by standard CAT 5-type cable is eliminated regardless of which combination of input/output cable lengths are selected.

When paired with the Extron MTP U T A D Universal Mini Twisted Pair Transmitter and Extron MTP U Series Universal Mini Twisted Pair Receivers, MTPX Series Twisted Pair Matrix Switchers allow composite video, S-video, component video, or RGBHV, along with audio or RS-232 control signals, to be sent over a single CAT 5-type cable and output on the appropriate connector at the display.

The powerful feature set in the MTPX Plus Series Twisted Pair Matrix Switchers enables integrators to greatly reduce installation time and costs associated with rack space, cabling, and installation, when compared to traditional twisted pair matrix switching.

Local Video and Audio Inputs and Outputs

In addition to the MTP inputs and outputs, MTPX Plus Series Matrix Switchers include local inputs and outputs for video and audio. Local video and audio inputs and outputs enable direct connection of equipment that is located within the same rack as the MTPX Matrix Switcher. This greatly simplifies system complexity by eliminating the need for additional MTP Series transmitters and receivers. The result is significant cost savings on rack space, equipment, cabling, and power requirements.

EDID Minder - MTPX Plus 128 Only

The MTPX Plus 128 features EDID Minder, a selectable feature that enables automatic and continuous management of the EDID information between the local input sources and the local displays. EDID Minder automatically captures and stores EDID information from the display. It also can generate emulated EDID data with 28 selectable rates to match the native resolution of the display. By maintaining continuous EDID communication with all local sources, EDID Minder ensures that the source powers up properly and reliably outputs content to the display.

Dynamic Skew Equalization

The MTPX Plus Series features integrated skew equalization on all inputs and outputs. This ground breaking methodology enables the necessary skew compensation to be configured during installation for each input/output combination, which is then applied automatically during operation. Since the skew compensation is in the matrix switcher, no skew compensation is required in the receivers.

Level and Peaking Compensation

MTPX Plus Series Twisted Pair Matrix Switchers feature level and peaking adjustments on each input. As with skew compensation, level and peaking adjustments are made for each input during installation and stored in memory. When an input is selected, the level and peaking compensation is automatically recalled from memory and applied instantly, resulting in optimized image quality for any cable length.

Video Output Pre-Peaking

All MTPX Plus models include video output pre-peaking, which provides additional compensation and optimizes the output video signal for longer cable runs. The MTPX Plus 128 features switchable video output pre-peaking on all outputs, while other sizes provide switchable video output pre-peaking on 50% of the available outputs. For example, the MTPX Plus 816 features eight twisted pair outputs with pre-peaking capability, while on the MTPX 3232, sixteen of the twisted pair outputs feature the pre-peaking capability.

Local RS-232 Insertion Ports

MTPX Plus Series Twisted Pair Matrix Switchers feature local RS-232 insertion ports, which allow direct insertion of bidirectional serial control signals into the MTP outputs. The MTPX Plus 128 features local RS-232 insertion ports for all MTP outputs, while other sizes provide local RS-232 insertion ports on 50% of the available outputs. These insertion ports eliminate the need for an additional control infrastructure for remote displays. Also, adding RS-232 signals to the UTP output extends serial control beyond the recommended 100-foot (30 m) distance.

IP Link Ethernet Connectivity

MTPX Plus Series Matrix Switchers are also equipped with Extron IP Link, a high performance intelligent network integration solution for professional A/V environments. IP Link is built around an integrated high performance Web server that features global compatibility with industry standard Ethernet communication protocols, multi-user support, and GlobalViewer™, a free Web-based asset management and remote control Web application.

Overview

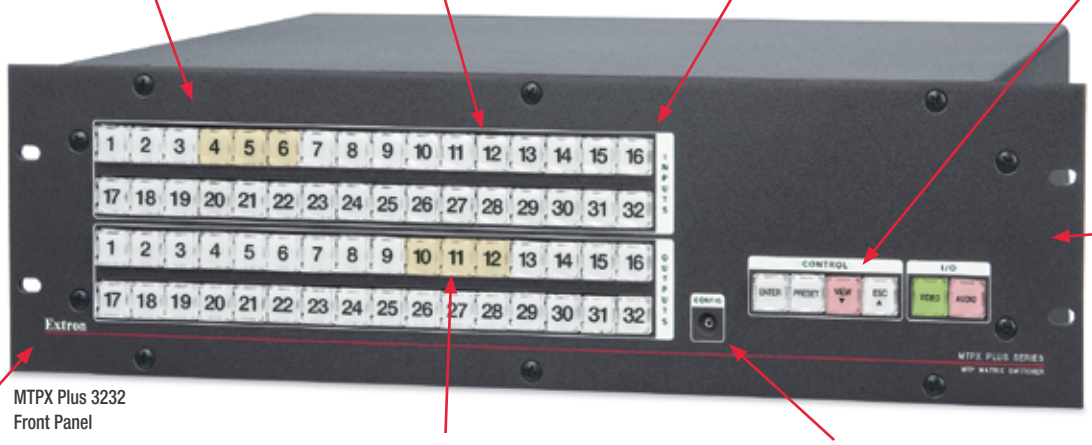
I/O grouping
Allows the matrix switcher to be virtually divided into smaller sub-switchers

Global presets
32 presets can be saved and recalled for frequently used I/O configurations

Rooming
All models can be programmed to group selected outputs into specific "rooms," each with its own set of unique presets

View I/O mode
Easily view which inputs and outputs are actively connected

Front panel security lockout
Restricts access in unsecured environments



MTPX Plus 3232
Front Panel

Enhanced QS-FPC - QuickSwitch Front Panel Controller
Individual input and output buttons for simple, intuitive operation

Tri-color, backlit buttons accept custom window labels
Clear plastic backlit buttons can be custom-labeled for easy identification. Buttons illuminate red, green, or amber, depending on function, for ease-of-use in low-light environments

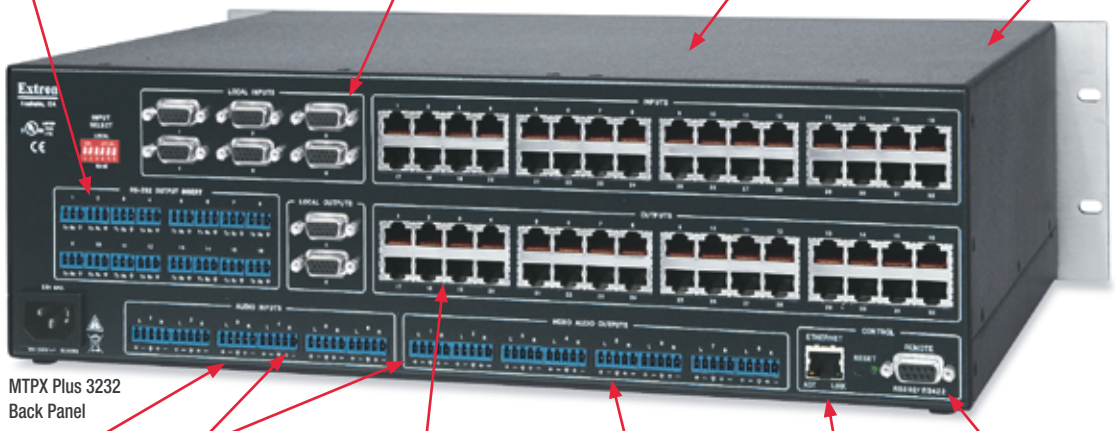
Front panel configuration port
For convenient configuration access after installation is complete

Local RS-232 insertion ports
Eight or sixteen RS-232 input ports eliminate the need for control system wiring to remote displays

Local high resolution video I/Os
Accept input from local video sources without the need for additional transmitters and receivers

Dynamic skew equalization
Adjustments are stored in memory for each input and output, maintaining RGB color alignment at all times

Level and peaking compensation
Actively compensates for input signal attenuation for various cable lengths, resulting in a brighter and sharper image



MTPX Plus 3232
Back Panel

Audio input gain and attenuation
Eliminate noticeable differences in volume when switching between sources

Local Audio I/Os
Support local audio sources for separate audio distribution, switching, or processing

Switchable video pre-peaking on 50% of the outputs
Provides additional compensation for optimal performance on the longest cable runs

Local audio output volume adjustment and muting
Eliminate the need for preamplifiers in many A/V systems

IP Link Ethernet connectivity
Enables Web-based remote management, monitoring, and control

IP LINK

RS-232 and RS-422 control
Enables switcher control and configuration via the Extron Windows-based control program, or integration into a third-party control system

MTPX Plus Models

SEVEN I/O SIZES

MTPX Plus MTP Twisted Pair Matrix Switchers are available in seven fixed I/O sizes from 12x8 to 32x32. Each model is compatible with Extron MTP Series transmitters and receivers, including the MTP U T A D Universal Mini Twisted Pair Transmitter and MTP U Series Universal Mini Twisted Pair Receivers. They are capable of routing video signals along with audio or RS-232 control signals on a single UTP cable. All seven models feature local inputs and outputs for high resolution video and audio, audio input gain/attenuation adjustment, audio output volume control on each local audio output, dynamic skew compensation, integrated level and peaking compensation, RS-232 control signal insertion, and Extron IP Link technology for Web-based, remote asset management.

MTPX Plus 128

12x8 MTP Twisted Pair Matrix Switcher with IP Link for RGBHV, Video, Audio, and RS-232

UNIQUE FEATURES

- Four local high resolution video and stereo audio inputs
- Two local high resolution video outputs
- EDID Minder for local inputs and outputs
- Two local summed mono audio outputs
- Eight local RS-232 insertion ports
- 1U, full rack width

MTPX Plus 816

8x16 MTP Twisted Pair Matrix Switcher with IP Link for RGBHV, Video, Audio, and RS-232

UNIQUE FEATURES

- Three local high resolution video and stereo audio inputs
- One local high resolution video output
- Four local summed mono audio outputs
- Eight local RS-232 insertion ports
- 2U, full rack width

MTPX Plus 168

16x8 MTP Twisted Pair Matrix Switcher with IP Link for RGBHV, Video, Audio, and RS-232

UNIQUE FEATURES

- Three local high resolution video and stereo audio inputs
- One local high resolution video output
- Four local summed mono audio outputs
- Four local RS-232 insertion ports
- 2U, full rack width

MTPX Plus 1616

16x16 MTP Twisted Pair Matrix Switcher with IP Link for RGBHV, Video, Audio, and RS-232

UNIQUE FEATURES

- Three local high resolution video and stereo audio inputs
- One local high resolution video output
- Four local summed mono audio outputs
- Eight local RS-232 insertion ports
- 2U, full rack width

MTPX Plus 1632

16x32 MTP Twisted Pair Matrix Switcher with IP Link for RGBHV, Video, Audio, and RS-232

UNIQUE FEATURES

- Six local high resolution video and stereo audio inputs
- Two local high resolution video outputs
- Eight local summed mono audio outputs
- Sixteen local RS-232 insertion ports
- 3U, full rack width

MTPX Plus 3216

32x16 MTP Twisted Pair Matrix Switcher with IP Link for RGBHV, Video, Audio, and RS-232

UNIQUE FEATURES

- Six local high resolution video and stereo audio inputs
- Two local high resolution video outputs
- Eight local summed mono audio outputs
- Eight local RS-232 insertion ports
- 3U, full rack width

MTPX Plus 3232

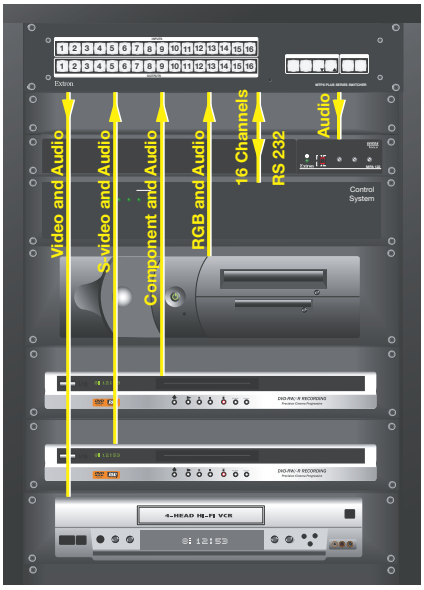
32x32 MTP Twisted Pair Matrix Switcher with IP Link for RGBHV, Video, Audio, and RS-232

UNIQUE FEATURES

- Six local high resolution video and stereo audio inputs
- Two local high resolution video outputs
- Eight local summed mono audio outputs
- Sixteen local RS-232 insertion ports
- 3U, full rack width

Features

LOCAL VIDEO AND AUDIO INPUTS AND OUTPUTS



In traditional twisted pair matrix switching, each local source requires a transmitter, and any local display, such as a rack-mounted monitor, requires a receiver. Integrating local devices uses up valuable RJ-45 inputs and outputs on the matrix switcher and adds to the overall cost of the system. It can be a technical challenge, as well, since twisted pair technology is not optimized for short cable runs.

The need to support local video and audio devices is uniquely addressed by the MTPX Plus Series Twisted Pair Matrix Switchers using local inputs and outputs.

Local video and audio inputs and outputs enable direct connection of equipment that is located within the same rack as the MTPX Matrix Switcher. This greatly simplifies system complexity by eliminating the need for additional MTP Series transmitters and receivers. The result is significant cost savings on rack space, equipment, cabling, and power requirements.

Local video and audio inputs directly accept signals from DVD players, tuners, computers, test signal generators or other source equipment located in the rack.

Local video and audio outputs provide a convenient connection for cueing monitors, video signal processors, videoconferencing systems, recording devices, audio signal processors or amplifiers located in the equipment rack.

RS-232 INSERTION PORTS

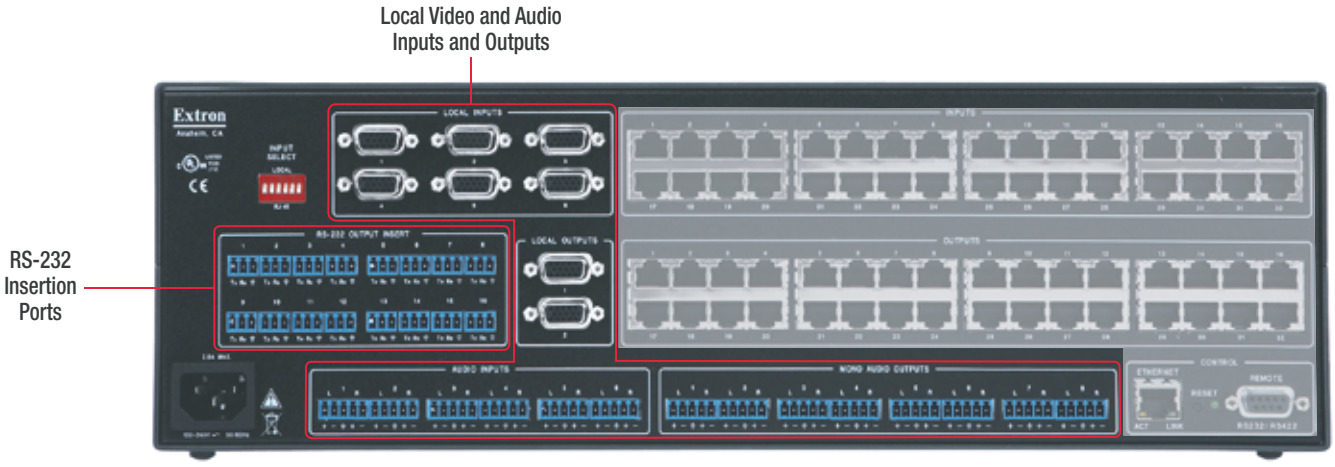
Traditionally, the A/V control system is mounted in the rack, along with the twisted pair matrix switcher. Remote control of the displays requires a completely separate cable infrastructure, which is an important yet costly part of the system.

MTPX Plus Series Twisted Pair Matrix Switchers address this problem with unique local RS-232 insertion ports. Each of these ports operates as a built-in RS-232 transmitter, which can be used to send control signals to the display on the same cable used for the video signal. Control signals applied to these connectors are inserted into the RJ-45 output signal for transmission to any Extron MTP Series receiver that accepts RS-232 signals, extending serial control beyond the recommended 100-foot (30 m) distance.

For example, the MTP U R RSA SEQ Universal Mini Twisted Pair receiver accepts video with audio or RS-232 on the same cable. When used together with an MTPX Plus Matrix Switcher, the MTP U R RSA SEQ receiver enables the system to route video and audio signals to a display and insert control signals whenever needed.

With the MTP U R RSA SEQ receiver, serial and audio signals cannot be transmitted simultaneously, but they can be sent on the same cable. For instance, you might send a control signal through the matrix to power up the display at the start of the day. Once the display is on, you can then route video and audio signals from any of the inputs.

Local RS-232 insertion ports on the MTPX Plus Series Twisted Pair Matrix Switchers eliminate the need for additional control infrastructure for remote displays.



Features

DYNAMIC SKEW EQUALIZATION

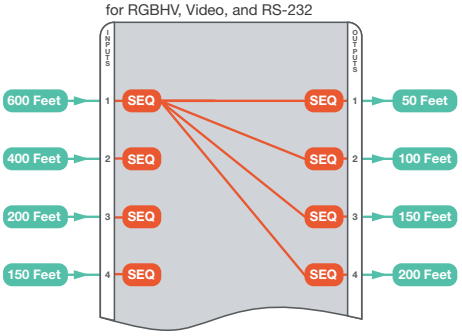
The MTPX Plus Series features integrated skew equalization on all inputs and outputs. This ground breaking methodology enables an installer to configure the necessary skew compensation during installation for each input and output. The compensation values are stored in the matrix switcher's memory and recalled automatically during operation.

In twisted pair video systems, skew is a distortion in the image caused by the late arrival of one or more of the color signals. Data grade twisted pair cable used in A/V systems was developed for computer networks where the twist differential is necessary to prevent crosstalk. High resolution video signals are subject to skew, particularly at long distances, because the transmitter processes the signal and sends each color down a separate pair of wires. In matrix switching applications, the total distance from transmitter to receiver changes with each input/output tie. Often, the receiver cannot adjust to the new signal path, resulting in a misaligned image.

Since the cause of the problem is the varying lengths of the individual pairs of wires, solutions include using a skew equalizer or a receiver with built-in skew delay equalization circuitry.

With dynamic skew compensation capabilities included in the MTPX Plus Series Matrix Switchers, the overall result is optimized image quality on every signal path and no skew compensation is required in the MTP receiver.

MTPX Plus 3232
Twisted Pair Matrix Switcher with IP Link for RGBHV, Video, and RS-232



VIDEO LEVEL & PEAKING COMPENSATION

Signal loss due to cable attenuation causes a soft, blurry, and dim image, and is particularly noticeable on longer cable runs. Many twisted pair receivers include level and peaking adjustments that help compensate for cable attenuation and improve image quality. In a twisted pair matrix switching application, however, the overall distance from the source to the display changes each time a new input/output tie is selected.

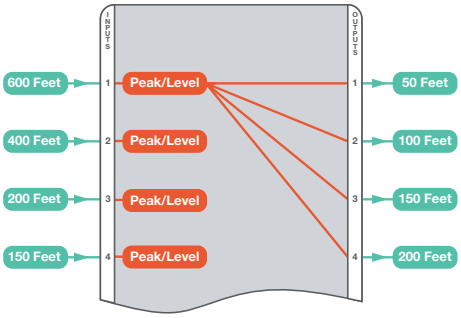
The typical solution to this problem involves a lot of extra cable. First, the longest matrix switcher input cable is measured and all the other input cables are cut to match. Next, the same is done on the output side. This results in a system where every cable run, from transmitter to receiver, is exactly the same, no matter which input/output tie is made. Any extra cable is rolled up and stored out of sight.

MTPX Plus Series Twisted Pair Matrix Switchers actively overcome this problem with superior results by providing individual level and peaking adjustments on the input side of the switcher. As with skew compensation, level and peaking adjustments are made for each input during installation and stored in memory.

When an input is selected, the level and peaking compensation previously set for that input is automatically recalled from memory and applied instantly. In this way, input cable length differences are equalized at the output of the matrix.

In addition, all MTPX Plus models include video output pre-peaking, which provides additional compensation and optimizes the output video signal for longer cable runs. The MTPX Plus 128 features switchable video output pre-peaking on all outputs, while other sizes provide switchable video output pre-peaking on 50% of the available outputs.

MTPX Plus 3232
Twisted Pair Matrix Switcher with IP Link for RGBHV, Video, Audio, and RS-232

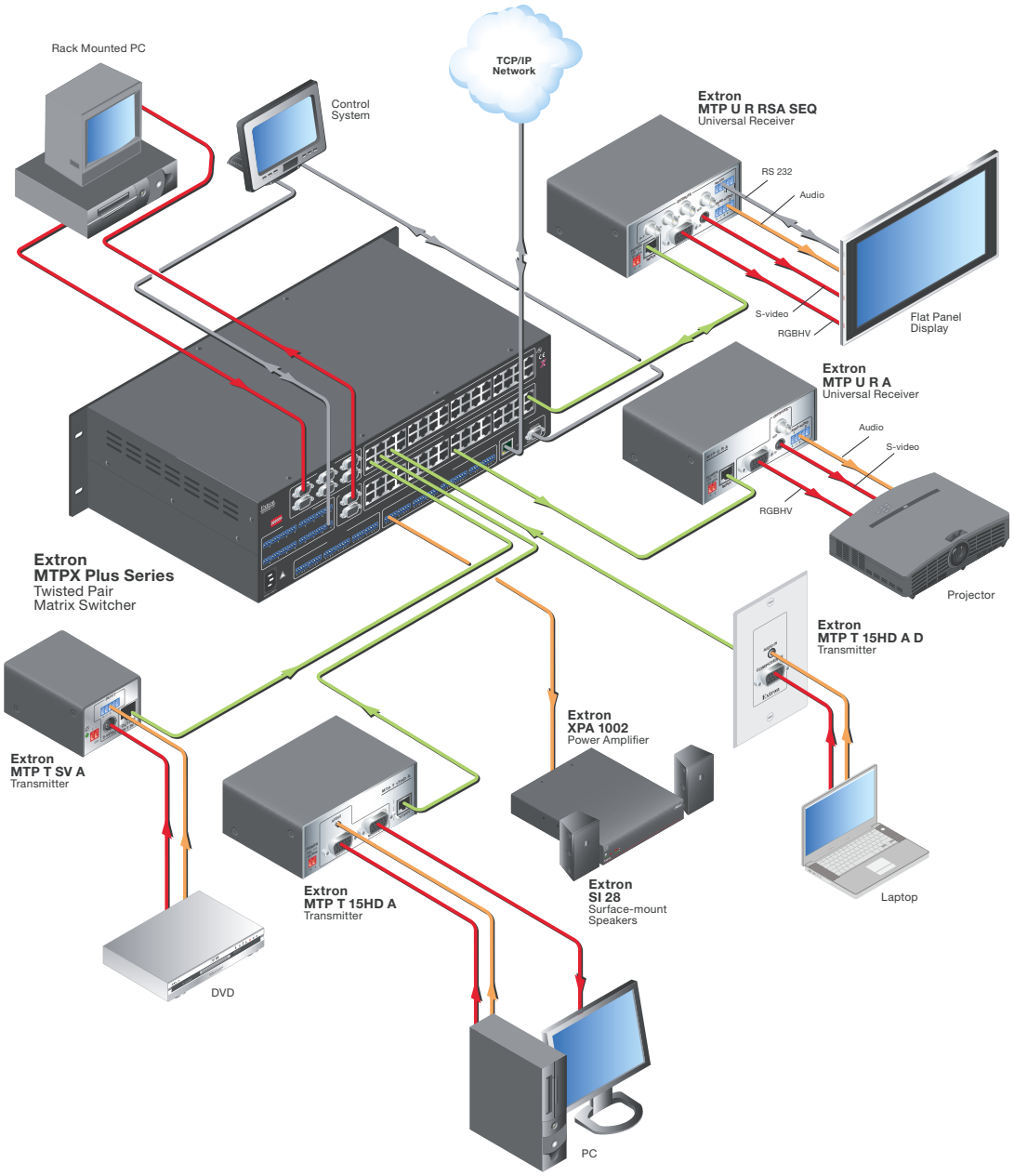


Learn More...
Step by step I/O Configuration

Visit the MTPX Plus product web page at Extron.com for a fully narrated E-Training video that provides a step by step tutorial on how to set up the MTPX to take full advantage of these must have features. www.extron.com/mtpxplusetraining

E-TRAINING MTPX PLUS

Application Diagram



Specifications

VIDEO

Gain ..... Unity
Crosstalk
816, 128, 168, 1616 models ..... -80 dB @ 1 MHz, -71 dB @ 5 MHz, -55 dB @ 10 MHz, -45 dB @ 30 MHz, -37 dB @ 100 MHz
1632, 3216, 3232 models ..... -90 dB @ 1 MHz, -76 @ 5 MHz, -72 dB @ 10 MHz, -60 dB @ 30 MHz, -50dB @ 100 MHz

VIDEO INPUT— LOCAL

Number/signal type ..... 3, 4, or 6 analog RGBHV, RGBS, RGsB, RsGsBs, component video (bi-level and tri-level), S-video, composite video
Connectors ..... 3, 4, or 6 female 15-pin HD
Nominal level ..... 0.7 Vp-p for RGB
Minimum/maximum levels ..... 0.3 V to 1.45 Vp-p with no offset at unity gain
Impedance ..... 75 ohms
Horizontal frequency ..... 15 kHz to 130 kHz
Vertical frequency ..... 30 Hz to 150 Hz

VIDEO INPUT — MAIN (see transmitters' output specifications)

Number/signal type ..... 8, 16, or 32 proprietary analog signals
Connectors ..... 8, 16, or 32 (depending on configuration) female RJ-45 connectors

VIDEO OUTPUT— LOCAL

Number/signal type ..... 1 or 2 analog RGBHV, RGBS, RGsB, RsGsBs, component video (bi-level and tri-level sync), S-video, composite video
Connectors ..... 1 or 2 female 15-pin HD
Nominal level ..... 0.7 Vp-p for RGB
Impedance ..... 75 ohms

VIDEO OUTPUT — main (see receivers' input specifications)

Number/signal type ..... 8, 16, or 32 proprietary analog signals
Connectors ..... 8, 16, or 32 (depending on configuration) female RJ-45 connectors

SYNC— LOCAL INPUTS AND OUTPUTS ONLY

Input type ..... RGBHV, RGBS, RGsB, RsGsBs
Output type ..... See receiver specifications (see specifications on Web site).
Standards ..... NTSC 3.58, NTSC 4.43, PAL, SECAM
Input level ..... 3.5 V to 5.5 Vp-p, unterminated; 4.0 V to 5.0 Vp-p normal
Output level ..... See receiver specifications (see specifications on Web site).
Input impedance ..... 573 ohms ± 5%
Output impedance ..... 110 ohms
Max. input voltage ..... 5.0 Vp-p
Max. rise/fall time ..... 4 ns
Polarity ..... Positive or negative

AUDIO

Gain (local inputs and outputs) ..... Unbalanced output: 0 dB; balanced output: +6 dB
Frequency response ..... 20 Hz to 20 kHz, ±1 dB
THD + Noise ..... 0.15% @ 1 kHz at nominal level
S/N ..... >70 dB at maximum output (unweighted)
CMRR ..... >43 dB @ 20 Hz to 20 kHz

AUDIO INPUT— LOCAL

Connectors ..... (3, 4, or 6) 3.5 mm captive screw connectors, 5 pole
Impedance ..... >10k ohms unbalanced
Nominal level ..... +4 dBu (1.23 Vrms), -10 dBV (316 mVrms)
Maximum level ..... +18 dBu, (unbalanced) at 1% THD+N
NOTE: 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu

AUDIO INPUT — MAIN (see transmitters' output specifications)

Number/signal type ..... 8, 16, or 32 proprietary analog signals
Connectors ..... 8, 16, or 32 (depending on configuration) female RJ-45 connectors

AUDIO OUTPUT— LOCAL

Number/signal type ..... 2, 4, or 8 dual mono, balanced/unbalanced
Connectors ..... (2, 4, or 8) 3.5 mm captive screw connectors, 5 pole
Impedance ..... 50 ohms unbalanced, 100 ohms balanced
Gain error ..... ±1 dB channel to channel

AUDIO OUTPUT — main (see receivers' input specifications)

Number/signal type ..... 8, 16, or 32 proprietary analog signals
Connectors ..... 8, 16, or 32 (depending on configuration) female RJ-45 connectors

CONTROL/REMOTE — SWITCHER HOST CONTROL

Serial host control ports
MTPX Plus 128 ..... 1 RS-232, rear panel 3.5 mm captive screw connector, 3 pole
All other models ..... 1 RS-232 or RS-422, rear panel 9-pin female D connector
1 RS-232 front panel 2.5 mm mini stereo jack
Baud rate and protocol ..... 9600 baud (default), 19200, 38400, and 115200 (adjustable); 8 data bits; 1 stop bit; no parity
Ethernet control port ..... 1 RJ-45 female connector
Ethernet data rate ..... 10/100Base-T, half/full duplex with autodetect
Ethernet protocol ..... ARP, ICMP (ping), IP, TCP, UDP, DHCP, HTTP, SMTP, Telnet

CONTROL/REMOTE — external device (pass-through, unidirectional, or bidirectional)

Serial control ports ..... RS-232, 3.5 mm captive screw connectors, 3 pole
3232 and 1632 models ..... 16 connectors
3216, 1616, 128, and 816 models ..... 8 connectors
168 models ..... 4 connectors
Baud rate and protocol ..... Up to 38400 baud, 9600 baud (default); 5-8 data bits; 1 or 2 stop bits; odd, even, or no parity; XON, XOFF, or no flow control
NOTE: Protocol is mirrored between the switcher and the receiver.

GENERAL

Recommended cable type ..... CAT 5/5E/6/7 (shielded or unshielded) or Extron Enhanced Skew-Free AV UTP
Power ..... 100 VAC to 240 VAC, 50-60 Hz, internal
1632, 3216, 3232 models ..... 220 watts
816, 168, 1616 models ..... 120 watts
128 model ..... 60 watts
Temperature/humidity ..... Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing
Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling ..... Fan, left to right (as viewed from the front panel)
Rack mount ..... Yes
Enclosure dimensions
1632, 3216, 3232 models ..... 5.25" H x 17.0" W x 9.4" D (3U high, full rack wide)
(13.3 cm H x 43.1 cm W x 23.9 cm D)
(Depth excludes connectors, width excludes rack ears.)
816, 168, 1616 models ..... 3.5" H x 17.0" W x 9.4" D (2U high, full rack wide)
(8.9 cm H x 43.1 cm W x 23.9 cm D)
(Depth excludes connectors, width excludes rack ears.)
128 model ..... 1.7" H x 17.4" W x 12.0" D (1U high, full rack wide)
(4.3 cm H x 44.2 cm W x 30.5 cm D)
(Depth excludes connectors, width excludes rack ears.)
Product weight
1632, 3216, 3232 models ..... 16 lbs (7.3 kg)
816, 168, 1616 models ..... 8.5 lbs (3.9 kg)
128 model ..... 3.7 lbs (1.6 kg)
Regulatory compliance
Safety ..... CE, CUL, UL
EMI/EMC ..... CE, C-tick, FCC Class A, ICES, VCCI Class A
Environmental ..... Complies with the appropriate requirements of WEEE.
MTBF ..... 30,000 hours
Warranty ..... 3 years parts and labor
NOTE: All nominal levels are at ±10%.

Model	Version Description	Part number
MTPX Plus 128	12x8	60-1015-01
MTPX Plus 816	8x16	60-834-01
MTPX Plus 168	16x8	60-833-01
MTPX Plus 1616	16x16	60-832-01
MTPX Plus 1632	16x32	60-898-01
MTPX Plus 3216	32x16	60-899-01
MTPX Plus 3232	32x32	60-897-01

Specifications are subject to change without notice.

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